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ABSTRACT

This document, which reflects Mississippi's statutory requirement that instructional programs be based on core curricula and performance-based assessment, contains outlines of the instructional units required in local instructional management plans and daily lesson plans for horticulture I and II. Presented first are a program description and course outlines. Section I contains curriculum frameworks for both courses, and section II contains outlines of the instructional units required in each course. Units in course I are as follows: horticulture careers and orientation, leadership development, plant structure and growth, plant classification and identification (taxonomy), plant growth media and nutrition, horticulture structures, basic plant propagation, horticulture chemical and pest management, basic principles of floristry, greenhouse crops, olericulture production, and interior plantscaping. Units in course II include the following: horticulture careers, nursery and landscape plant identification, advanced plant propagation, horticulture marketing and business procedures, container and field crop production, floriculture crop production, landscape design, landscape installation and construction, landscape maintenance, turfgrass installation and maintenance, pomology production, and advanced floral design. Each unit includes suggested time on tasks, competencies and objectives, teaching strategies, assessment strategies, and resources. Recommended tools and equipment are listed in section III. Appended are lists of related academic topics and workplace skills for the 21st century and student competency profiles for both courses. (YLB)

ED 397 284

Mississippi Curriculum Framework for Horticulture

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CE 072 169

Secondary
Vocational and Technical Education
1996

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July 30, 1996

MISSISSIPPI

CURRICULUM FRAMEWORK

FOR

HORTICULTURE

(PROGRAM CIP: 01.0601 – Horticulture Serv. Op. & Mgmt., Gen.)

SECONDARY PROGRAMS

1996

July 30, 1996

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FOREWORD

The courses in this document reflect the following statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended:

> The State Department of Education shall provide an instructional program and establish guidelines and procedures for managing such programs in the public schools as part of the State Program of Educational Accountability and Assessment of Performance. . .
>
> The department shall provide that such program or guidelines . . . are enforced through the performance-based accreditation system.
>
> The local school board must adopt the objectives that will form the core curriculum that will be systematically delivered throughout the district.
>
> Standards for student performance must be established for each core objective in the local program and those standards establish the district's definition of mastery for each objective.
>
> There shall be an annual review of student performance in the instructional program against locally established standards.

Each secondary vocational-technical course consists of a series of instructional units which focus on a common theme. All units have been written using a common format which includes the following components:

- Unit Number and Title
- Suggested Time on Task - The number of days of instruction that should be required to teach the competencies and objectives of the unit. For secondary occupational programs, a "day" represents a two-period block of instruction.
- Competencies and Suggested Objectives
  - A **Competency** represents a general concept of performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to master all competencies in the curriculum framework in order to satisfactorily complete the course.
  - The **Suggested Objectives** represent the enabling and supporting knowledge and performances that will indicate mastery of the competency.
- Suggested Teaching Strategies - This section of each unit indicates strategies that can be used to enable students to master each suggested objective. Teachers should feel free to modify or enhance these suggestions based on needs of their students and resources available in order to provide optimum learning experiences for their students.

- Suggested Assessment Strategies - This section indicates strategies that can be used to measure student mastery. Examples of suggested strategies could include classroom discussions, laboratory exercises, and student assignments. Again, teachers should feel free to modify or enhance these suggested assessment strategies based on local needs and resources.
- Suggested Resources - This section indicates some of the primary instructional resources that may be used to teach the competencies and suggested objectives. Again, these resources are suggested and the list may be modified or enhanced based on needs and abilities of students and on available resources.

The following guidelines were used in developing the curriculum framework in this document and should be considered in developing local instructional management plans and daily lesson plans:

- The content of the courses in this document reflects approximately 75 percent of the time allocated to each course. For a one-year course, this means that the content of the existing units of instruction should represent approximately 135 days of instruction. The remaining 25 percent of each course should be developed at the local district level and may reflect:
  - Additional units of instruction within the course related to topics not found in the state framework.
  - Activities which develop a higher level of mastery on the existing competencies and suggested objectives.
  - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed/revised.
  - Activities which implement components of the Mississippi Tech Prep Initiative, including integration of academic and vocational-technical skills and coursework, school-to-work transition activities, and articulation of secondary and postsecondary vocational-technical programs.
  - Individualized learning activities, including work site learning activities, to better prepare individuals in the courses for their chosen occupational area.
- Sequencing of the units of instruction within a course is left to the discretion of the local district. Naturally, foundation units related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other units related to specific skill areas in the course, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors.

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July 30, 1996

PROGRAM DESCRIPTION

HORTICULTURE

(Program CIP: 01.0601 - Horticulture Serv. Op. & Mgmt., Gen.)

The secondary program in Horticulture prepares individuals for entry level employment or continuing education in a wide variety of fields in the horticulture industry. Students enrolled in the program participate in a variety of instructional activities including lectures, discussions, laboratory experiences at the school, and work-based learning activities in the field such as field trips and shadowing experiences. Students also receive supplementary instruction and reinforcement of learning through activities in the FFA. Topics covered in the two-year program include plant structure and growth; plant propagation; pest management; floristry; greenhouse crops and management; olericulture; plantscaping; landscape design, installation, and management; and turfgrass management.

COURSE OUTLINE

HORTICULTURE I

Unit #	Title	No. of Days
Unit 1	Horticulture Careers and Orientation	10
Unit 2	Leadership Development	5
Unit 3	Plant Structure and Growth	10
Unit 4	Plant Classification and Identification (Taxonomy)	10
Unit 5	Plant Growth and Media	15
Unit 6	Introduction to Horticulture Structures	5
Unit 7	Basic Plant Production	15
Unit 8	Horticulture Chemicals and Pest Management	20
Unit 9	Basic Principles of Floristry	15
Unit 10	Greenhouse Crops	10
Unit 11	Olericulture Production	10
Unit 12	Interior Plantscaping	10

HORTICULTURE II

Unit #	Title	No. of Days
Unit 1	Horticulture Careers	5
Unit 2	Nursery and Landscape Plant Identification	15
Unit 3	Advanced Plant Propagation	10
Unit 4	Horticulture Marketing and Business Procedures	10
Unit 5	Container and Field Crop Production	10
Unit 6	Floriculture Crop Production	10
Unit 7	Landscape Design	20
Unit 8	Landscape Installation and Construction	15
Unit 9	Landscape Maintenance	10
Unit 10	Turfgrass Management	10
Unit 11	Pomology Production	5
Unit 12	Advanced Floral Design	15

SECTION I:

CURRICULUM FRAMEWORK

FOR

HORTICULTURE

CURRICULUM FRAMEWORK

Course Name: Horticulture I

Course CIP Code: 01.0601

Course Description: Horticulture I is the introductory course in the secondary horticulture program. Students in this course gain a foundation of competencies related to careers and leadership development; plant structure, growth, and classification; growing media; propagation; chemical and pest management; and floristry and greenhouse operations. (2-2½ Carnegie units, depending upon time spent in the course)

Competencies and Suggested Objectives:

1. Identify careers in the horticulture industry.
   a. Describe the major divisions of the horticulture industry, including olericulture, pomology, floriculture, and landscaping.
   b. Describe career opportunities in the horticulture industry in relation to work skills, working conditions, and educational requirements.
   c. Identify job seeking skills required in the horticulture industry, including writing a letter of application, completing a job application, and developing a resume.

   Related Academic Topics (See Appendix A): C4, C6
   Workplace Skills (See Appendix B): WP2, WP3
2. Identify school and program policies and procedures related to the horticulture program.
   a. Describe school policies related to the horticulture program.
   b. Describe program policies related to the horticulture program, including general safety practices to follow in the horticulture facility.

   Related Academic Topics (See Appendix A): C4, C6
   Workplace Skills (See Appendix B): WP2, WP4
3. Identify and describe the role of organizations that encourage leadership development.
   a. Identify and describe the role of student youth organizations that encourage leadership development.
   b. Identify and describe the role of trade organizations in horticulture that encourage leadership development.

   Related Academic Topics (See Appendix A): C4, C6
   Workplace Skills (See Appendix B): WP2, WP3
4. Identify parts of a plant and their functions.
   a. Identify the primary parts of a plant and describe the function of each part, including roots, stems, leaves, and flowers.

b. Identify the various types of each primary part and discuss the differences in each type.

Related Academic Topics (See Appendix A): S2, S5, S7
Workplace Skills (See Appendix B): WP2

5. Describe the growth process in plants.
   a. Describe processes by which plants grow including photosynthesis, respiration, transpiration, and translocation.
   b. Describe the relationship of environmental and cultural factors to plant growth (water, light, temperature, soil, climatic zones, etc.).

   Related Academic Topics (See Appendix A): S2, S5, S7
   Workplace Skills (See Appendix B): WP2
6. Apply systems of plant classification.
   a. Compare the different systems of plant classification according to life cycle (annual, biennial, and perennial); leaf cycle (evergreen and deciduous); and seed leaf number (monocot and dicot).
   b. Describe the use of the binomial system in classifying plants including common and scientific names.
   c. Demonstrate the use of the binomial system to classify a common plant by genus and species.

   Related Academic Topics (See Appendix A): S3, S8, C1, C6
   Workplace Skills (See Appendix B):WP2, WP4, WP6
7. Describe and apply principles of plant growth media.
   a. Describe the characteristics and components of soil.
   b. Describe the characteristics of a suitable growing media.
   c. Differentiate between a soil and soil-less medium.
   d. Identify the components used in mixing a soil-less medium.
   e. Prepare a growing media to specifications.

   Related Academic Topics (See Appendix A): M4, S4, S5
   Workplace Skills (See Appendix B): WP2
8. Describe and apply basic principles of plant nutrition.
   a. Identify the major nutrients needed for plant growth and describe their effects on plant growth.
   b. Identify the minor nutrients needed for plant growth and describe their effects on plant growth.
   c. Describe the effect of soil pH on nutrient availability and plant growth.
   d. Demonstrate the procedure for obtaining a soil sample for nutrient and pH testing.
   e. Determine the pH of a soil or medium.
   f. Interpret results of a soil test to determine the correct amount of amendments to be applied to a given area of soil or medium.

   Related Academic Topics (See Appendix A): S4, S5
   Workplace Skills (See Appendix B): WP2

9. Describe the characteristics and features of different types of greenhouses.
   a. Identify and compare the different styles of greenhouses (Quonset, Gothic, lean-to, A-frame, etc.).
   b. Identify and compare the different types of greenhouse frames (metal, wood, plastic/PVC, etc.) and coverings (fiberglass, glass, polyethylene, lexon, etc.).
   c. Identify and compare the different types of heating, cooling, and ventilation systems used in greenhouses.
   d. Identify and compare the types of irrigation and chemigation systems used in greenhouses.
   e. Identify and describe factors to consider in establishing a floor plan for a greenhouse including benching, flooring, and traffic patterns.
   f. Describe sanitation practices employed in greenhouse production.

   Related Academic Topics (See Appendix A): C2, C6, M5, S5, S6
   Workplace Skills (See Appendix B): WP2, WP6
10. Describe auxiliary structures associated with horticulture.
   a. Describe the functions of auxiliary structures associated with horticultural operations including lathe houses, cold frames, shade houses, hot beds, potting facilities, chemical and dry storage facilities, etc.

   Related Academic Topics (See Appendix A): C6, S6
   Workplace Skills (See Appendix B): WP2
11. Distinguish between sexual and asexual propagation methods.
   a. Describe the distinguishing characteristics of sexual and asexual propagation methods and discuss how these are used by horticulturists in reproducing and breeding plants.

   Related Academic Topics (See Appendix A): C6, S2
   Workplace Skills (See Appendix B): WP2, WP6
12. Describe and apply principles of sexual reproduction.
   a. Describe the sexual reproductive process in plants.
   b. Identify the parts of a seed and describe their functions.
   c. Propagate plants from seed.
   d. Conduct a seed germination test.

   Related Academic Topics (See Appendix A): S2, M6
   Workplace Skills (See Appendix B): WP2, WP6
13. Describe and apply principles of asexual reproduction.
   a. Identify the common types of asexual reproduction and discuss their applications in horticulture.
   b. Identify common tools used in asexual reproduction and demonstrate their safe care and use.
   c. Propagate plants from root, stem, and leaf cuttings.
   d. Propagate plants by division/separation.
   e. Propagate plants by layering.

   Related Academic Topics (See Appendix A): S2, S7
   Workplace Skills (See Appendix B): WP2

14. Identify common pests and describe the in which they cause damage to horticultural crops.
    a. Identify common insect pests of horticultural crops and describe how each causes damage to the crop.
    b. Identify common diseases of horticultural crops and describe how each causes damage to the crop.
    c. Identify common weeds found in horticultural crops and describe how weeds cause damage to crops.
    d. Describe requirements for plant pest control certification/licensure.

    Related Academic Topics (See Appendix A): C2, S2
    Workplace Skills (See Appendix B): WP2, WP6
15. Identify and apply pest management and control methods.
    a. Identify and describe the use of biological control methods including use of beneficial insects, resistant varieties, repellant plants, etc.
    b. Identify and describe the use of cultural control methods including sanitation, mechanical practices, crop rotation, etc.
    c. Identify and describe the use of chemical control methods including herbicides, insecticides, fungicides, etc.
    d. Identify the different types of chemical formulations including dusts, wetable powders, emulsions, granules, concentrated liquids, aerosols and fumigants, stickers and spreaders, etc.
    e. Identify common names and trade names for chemicals frequently used in horticulture including insecticides, herbicides, and fungicides.
    f. Interpret information found on a chemical label.
    g. Demonstrate safe, approved procedures for handling, storing, mixing, applying, and disposing of chemicals and chemical containers.

    Related Academic Topics (See Appendix A): C1, C2, C4, M4, S2
    Workplace Skills (See Appendix B): WP2, WP6
16. Describe and apply basic principles of floristry.
    a. Describe career opportunities in floristry ranging from owner-operator to designer and salesperson.
    b. Demonstrate the safe and proper use of tools and supplies used in floristry including shears, tape, foam, floral wire, etc.
    c. Identify plant materials used in floristry including flower and foliage materials.
    d. Demonstrate the procedures for receiving and storing (including rotation of inventory) floral materials.
    e. Describe basic design principles including balance, transition, rhythm, focal point, proportion, scale, etc.
    f. Receive and process orders for floral products.
    g. Create basic floral design products including a packaged single corsage, bud vase, round centerpiece, and a dressed (wrapped) potted plant.

    Related Academic Topics (See Appendix A): C6, M7, S2
    Workplace Skills (See Appendix B): WP2

17. Describe and apply principles of greenhouse crop production.
    a. Identify different types of greenhouse crops (bedding plants, vegetables, flowering plants, foliage plants, etc.) and common species of each type.
    b. Describe cultural considerations for greenhouse crops including fertilizer, water, growing medium, pest control, temperature, natural and chemical growth control and stimulation, and light control for common crops.
    c. Produce a greenhouse crop following accepted commercial practices.

    Related Academic Topics (See Appendix A): C6, S3, M7, S2
    Workplace Skills (See Appendix B): WP2, WP4, WP5
18. Describe and apply principles of olericulture production.
    a. Describe characteristics of common vegetables grown for commercial production including cultural requirements, seed versus transplant planting, plant growth style, growing season, etc.
    b. Identify and demonstrate the use of common tools and equipment used in gardening including tillers, spreaders, sprayers, watering devices, rakes, hoes, shovels, etc.
    c. Identify and describe factors to consider in preparing a seedbed including soil class and texture, use of soil amendments, and characteristics of a properly prepared seedbed.
    d. Develop a plan for an intensive culture garden including crop and variety selection, location and spacing of different crops, scheduling of crops, and harvesting and marketing of crops.
    e. Describe cultural practices associated with growing of vegetables including fertilization, integrated pest control measures, and irrigation.
    f. Identify common garden pests including insects, diseases, and weeds.
    g. Produce a vegetable crop.

    Related Academic Topics (See Appendix A): C6, S2, S3, S4
    Workplace Skills (See Appendix B): WP2, WP4, WP6
19. Describe and apply principles of interior plantscaping.
    a. Describe careers in interior plantscaping.
    b. Define interior plantscaping and discuss its importance.
    c. Describe factors to consider in selecting plants for interior plantscaping.
    d. Identify plants for specific locations in plantscaping.
    e. Describe cultural procedures for interior plantscapes including fertilization, watering, sanitation, and pest control.
    f. Plan, construct, and maintain an interior plantscape.

    Related Academic Topics (See Appendix A): C6, S2, S6
    Workplace Skills (See Appendix B): WP2, WP6

CURRICULUM FRAMEWORK

Course Name: Horticulture II

Course CIP Code: 01.0690

Course Description: Horticulture II is a continuation of Horticulture I. Students enrolled in this course gain competencies related to nursery and floriculture crop production; advanced propagation techniques; marketing and business procedures; and landscape design, installation, and maintenance. (2-2½ Carnegie units, depending upon time spent in the course)

Competencies and Suggested Objectives:

1. Investigate career and educational opportunities in horticulture.
   a. Prepare a comprehensive report on a career in a chosen occupational area based on research and observations.
   b. Develop a plan for post-high school activities (education, employment, entrepreneurship, etc.).
   c. Utilize electronic communication (Internet or E-mail, if available) to obtain occupational information.

   Related Academic Topics (See Appendix A): C6
   Workplace Skills (See Appendix B): WP2, WP3, WP6
2. Review program policies and procedures.
   a. Review program operation policies and procedures, including general safety procedures.

   Related Academic Topics (See Appendix A): C6
   Workplace Skills (See Appendix B): WP2, WP6
3. Identify and describe the use of major plants used associated with nursery and landscape operations.
   a. Identify and describe the use of major nursery plants including trees, shrubs, ground covers, vines, and ornamental grasses.
   b. Identify and describe the use of major flowering plants including annuals, biennials, and perennials.
   c. Identify and describe the use of major water plants.
   d. Identify and describe the use of major foliage plants used in nursery and landscape operations.
   e. Identify and describe the use of wildflowers in landscape operations

   Related Academic Topics (See Appendix A): S2
   Workplace Skills (See Appendix B): WP2
4. Describe and apply advanced plant propagation methods.
   a. Propagate plants by grafting.
   b. Propagate plants from scarified or stratified seeds.
   c. Propagate plants by tissue culture.

Related Academic Topics (See Appendix A): S2, S7
Workplace Skills (See Appendix B): WP2

5. Describe and apply marketing and business practices associated with horticulture operations.
   a. Develop a yearly schedule of activities/enterprises for a horticulture business.
   b. Describe factors to consider in ordering materials/supplies for an enterprise.
   c. Describe factors to consider in pricing products of an enterprise.
   d. Describe factors to consider in marketing and advertising products.
   e. Complete a sales transaction including providing customer service and completing a sales ticket.

   Related Academic Topics (See Appendix A): C4, C6, M1, M7
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP4, WP6
6. Describe and apply principles of container and field crop production.
   a. Describe advantages and disadvantages of container crop production.
   b. Describe factors to consider in selecting a site for container and field crop production.
   c. Describe factors to consider in selecting a container for production.
   d. Identify and demonstrate the safe use of tools and equipment for container and field crop production.
   e. Describe cultural requirements for container and field crop production including fertilizer, water, pest control, and harvesting procedures.
   f. Produce container and field grown plants.
   g. Describe automation and plug production in the nursery industry.

   Related Academic Topics (See Appendix A): C6, M7, S2, S4
   Workplace Skills (See Appendix B): WP2, WP6
7. Describe and apply principles of floral crop production.
   a. Develop growing plans and schedules for a fall and a spring floral crop.
   b. Describe optimum production practices for flower crops to include benches and media, shading/light requirements, temperature, water, fertilizer, and pest control practices.
   c. Produce a specialty flower crop.

   Related Academic Topics (See Appendix A): C6, S2
   Workplace Skills (See Appendix B): WP1, WP2, WP6
8. Describe and apply principles of landscape design
   a. Describe careers in the landscape design field.
   b. Identify and demonstrate the use of tools and equipment for landscape design, including computer-assisted landscape design hardware and software.
   c. Identify symbols used in landscape design plans.
   d. Describe principles of design associated with landscaping including simplicity, balance, proportion, etc.
   e. Prepare a site analysis/needs assessment for a given site.

f. Prepare a simple landscape plan to scale for a given site to include plant selection and location.

Related Academic Topics (See Appendix A): C6,
Workplace Skills (See Appendix B): WP1, WP2, WP6

9. Describe and apply basic principles of landscape installation and construction.
   a. Describe essential elements of a landscape installation contract and pricing proposal.
   b. Develop a contract and pricing proposal for the landscape plan developed by the students in Unit 7.
   c. Prepare a planting site, install plants, and provide post-transplant care according to a landscape plan.
   d. Describe licensing requirements for landscape installation.
   e. Demonstrate installation of a landscape irrigation system.

   Related Academic Topics (See Appendix A): C6, M7
   Workplace Skills (See Appendix B): WP1, WP3, WP6
10. Describe and apply principles of landscape maintenance.
   a. Discuss skills required for year-round landscape maintenance.
   b. Identify and demonstrate the safe use of equipment for landscape maintenance including saws, pruning shears, string trimmers, hedge trimmers, blowers, etc.
   c. Determine fertilizer and pest control needs of trees, shrubs, and beds.
   d. Develop a year-round schedule and cost estimate for maintenance of trees, shrubs, and beds.
   e. Maintain trees, shrubs, and beds according to the year-round schedule.
   f. Demonstrate maintenance of a landscape irrigation system.
   g. Describe elements of a contract and warranty agreement for landscape maintenance.

   Related Academic Topics (See Appendix A): C6, S2
   Workplace Skills (See Appendix B): WP1, WP2, WP6
11. Describe and apply principles of turfgrass installation.
   a. Describe factors to consider in selecting a turfgrass for a specific area.
   b. Identify varieties of turfgrass and describe their characteristics.
   c. Describe installation practices for different turfgrasses, including site preparation and initial care.
   d. Develop a plan and cost estimate for establishing turf.

   Related Academic Topics (See Appendix A): C6, S2, M7
   Workplace Skills (See Appendix B): WP1, WP2, WP6
12. Describe and apply principles of turfgrass maintenance.
   a. Identify and demonstrate the safe use of equipment and tools used for turfgrass maintenance including mowers, dethatchers, aerators, etc.
   b. Perform preventive maintenance on small gasoline engine power equipment such as changing oil and filters, mixing gasoline and oil for two-cycle engines, servicing the engine, etc.

c. Identify common pests of turfgrass including insects, diseases, and weeds.
d. Mow turf to correct height for a specific grass.
e. Calibrate equipment and apply fertilizer to turf in correct proportions.
f. Calibrate equipment and apply herbicides, pesticides, and other pest control chemicals in correct proportions.
g. Describe common irrigation methods for turfgrass.
h. Perform repair/renovation practices including aeration and dethatching.
i. Develop a plan/cost estimate for a turfgrass management program.

Related Academic Topics (See Appendix A): C6, M7, S2, S6
Workplace Skills (See Appendix B): WP1, WP2, WP6

13. Describe and apply principles of fruit and berry production.
    a. Identify common fruits and berries produced in Mississippi and discuss general cultural practices.
    b. Prepare a site and install fruit or berry plants.
    c. Provide cultural care for fruit or berry plants to include pruning, fertilizing, pest control, and harvesting.
    d. Describe marketing of fruits and vegetables.

    Related Academic Topics (See Appendix A): S2
    Workplace Skills (See Appendix B): WP2, WP6
14. Apply advanced principles of floral design.
    a. Prepare a wire order for a floral arrangement.
    b. Receive a wire order for a floral arrangement.
    c. Prepare a window display.
    d. Prepare a funeral spray.
    e. Prepare a nosegay arrangement.
    f. Prepare a dried arrangement.
    g. Prepare a silk arrangement.

    Related Academic Topics (See Appendix A): C3, C6, M7
    Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

SECTION II:

CURRICULUM GUIDE

FOR

HORTICULTURE

HORTICULTURE I

HORTICULTURE I
UNIT 1: HORTICULTURE CAREERS AND ORIENTATION (10 days)

Competencies and Suggested Objectives:

1. Identify careers in the horticulture industry.
   a. Describe the major divisions of the horticulture industry, including olericulture, pomology, floriculture, and landscaping.
   b. Describe career opportunities in the horticulture industry in relation to work skills, working conditions, and educational requirements.
   c. Identify job seeking skills required in the horticulture industry, including writing a letter of application, completing a job application, and developing a resume.

   Related Academic Topics (See Appendix A): C4, C6
   Workplace Skills (See Appendix B): WP2, WP3
2. Identify school and program policies and procedures related to the horticulture program.
   a. Describe school policies related to the horticulture program.
   b. Describe program policies related to the horticulture program, including general safety practices to follow in the horticulture facility.

   Related Academic Topics (See Appendix A): C4, C6
   Workplace Skills (See Appendix B): WP2, WP4

Suggested Teaching Strategies:

1. *Identify careers in the horticulture industry.*
   a. Assigned readings, lecture and discussion, field trips and resource speakers.
   b. Assigned readings, lecture and discussion, field trips and resource speakers.
   c. Class discussion and student assignments.
2. *Identify school and program policies and procedures related to the horticulture program.*
   a. Have students read the student handbook and discuss rules in class.
   b. Discuss specific procedures related to the horticulture program including general safety procedures to be followed at all times.

Suggested Assessment Strategies:

1. *Identify careers in the horticulture industry.*
   a. Unit test and feedback from class discussion.
   b. Unit test and feedback from class discussion.
   c. Unit test and feedback from class discussion.

2. *Identify school and program policies related to the horticulture program.*
   a. *Signed statement by student and parent acknowledging understanding of the school rules.*
   b. *Unit test on safety and other horticulture program policies.*

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Local school student handbook.

Local career center/library.

HORTICULTURE I
UNIT 2: LEADERSHIP DEVELOPMENT **(5 days)**

Competencies and Suggested Objectives:

1. Identify and describe the role of organizations that encourage leadership development.
   a. Identify and describe the role of student youth organizations that encourage leadership development.
   b. Identify and describe the role of trade organizations in horticulture that encourage leadership development.

   Related Academic Topics (See Appendix A): C4, C6
   Workplace Skills (See Appendix B): WP2, WP3

Suggested Teaching Strategies:

1. *Identify and describe the role of organizations that encourage leadership development.*
   a. *Assigned readings, lecture, and discussion.*
   b. *Assigned readings, lecture, and discussion.*

Suggested Assessment Strategies:

1. *Identify and describe the role of organizations that encourage leadership development.*
   a. *Unit test and practice activities.*
   b. *Unit test.*

Suggested References:

FFA Student Handbook.

Mississippi Nurseryman's Association Certification Manual.

American Nurseryman's Association Handbook.

HORTICULTURE I
UNIT 3: PLANT STRUCTURE AND GROWTH (10 days)

Competencies and Suggested Objectives:

1. Identify parts of a plant and their functions.
   a. Identify the primary parts of a plant and describe the function of each part, including roots, stems, leaves, and flowers.
   b. Identify the various types of each primary part and discuss the differences in each type.

   Related Academic Topics (See Appendix A): S2, S5, S7
   Workplace Skills (See Appendix B): WP2
2. Describe the growth process in plants.
   a. Describe processes by which plants grow including photosynthesis, respiration, transpiration, and translocation.
   b. Describe the relationship of environmental and cultural factors to plant growth (water, light, temperature, soil, climatic zones, etc.).

   Related Academic Topics (See Appendix A): S2, S5, S7
   Workplace Skills (See Appendix B): WP2

Suggested Teaching Strategies:

1. *Identify parts of a plant and their functions.*
   a. *Illustrated lecture using transparencies, models, specimens, etc.*
   b. *Illustrated lecture using transparencies, models, specimens, etc.*
2. *Describe the growth process in plants.*
   a. *Illustrated lecture, lab projects, and demonstrations.*
   b. *Illustrated lecture, lab projects, and demonstrations.*

Suggested Assessment Strategies:

1. *Identify parts of a plant and their functions.*
   a. *Unit test.*
   b. *Unit test.*
2. *Describe the growth process in plants.*
   a. *Unit test.*
   b. *Unit test.*

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Cooper's *Agriscience.*

HORTICULTURE I
UNIT 4: PLANT CLASSIFICATION AND IDENTIFICATION (TAXONOMY) (10 days)

Competencies and Suggested Objectives:

1. Apply systems of plant classification.
   a. Compare the different systems of plant classification according to life cycle (annual, biennial, and perennial); leaf cycle (evergreen and deciduous); and seed leaf number (monocot and dicot).
   b. Describe the use of the binomial system in classifying plants including common and scientific names.
   c. Demonstrate the use of the binomial system to classify a common plant by genus and species.

   Related Academic Topics (See Appendix A): S3, S8, C1, C6
   Workplace Skills (See Appendix B):WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Apply systems of plant classification.*
   a. *Illustrated lecture and discussion using specimens, transparencies, models, etc.*
   b. *Illustrated lecture and discussion using specimens, transparencies, models, etc.*
   c. *Laboratory demonstration and student practice.*

Suggested Assessment Strategies:

1. *Apply systems of plant classification.*
   a. *Unit test or performance based activity.*
   b. *Unit test or performance based activity.*
   c. *Performance based assignment to classify a plant.*

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

A Reference Unit on Basic Principles of Plant Science.

Plant Classification Key.

Ingles, Jack E. Ornamental Horticulture: Science, Operations, and Management (2nd ed.). Danville: Interstate Printers and Publishers. 1994.

HORTICULTURE I
UNIT 5: PLANT GROWTH MEDIA AND NUTRITION (15 days)

Competencies and Suggested Objectives:

1. Describe and apply principles of plant growth media.
   a. Describe the characteristics and components of soil.
   b. Describe the characteristics of a suitable growing media.
   c. Differentiate between a soil and soil-less medium.
   d. Identify the components used in mixing a soil-less medium.
   e. Prepare a growing media to specifications.

   Related Academic Topics (See Appendix A): M4, S4, S5
   Workplace Skills (See Appendix B): WP2
2. Describe and apply basic principles of plant nutrition.
   a. Identify the major nutrients needed for plant growth and describe their effects on plant growth.
   b. Identify the minor nutrients needed for plant growth and describe their effects on plant growth.
   c. Describe the effect of soil pH on nutrient availability and plant growth.
   d. Demonstrate the procedure for obtaining a soil sample for nutrient and pH testing.
   e. Determine the pH of a soil or medium.
   f. Interpret results of a soil test to determine the correct amount of amendments to be applied to a given area of soil or medium.

   Related Academic Topics (See Appendix A): S4, S5
   Workplace Skills (See Appendix B): WP2

Suggested Teaching Strategies:

1. *Describe and apply principles of plant growth media.*
   a. Illustrated lecture and discussion.
   b. Illustrated lecture and discussion.
   c. Illustrated lecture and discussion.
   d. Illustrated lecture and discussion.
   e. Laboratory demonstration and practice.
2. *Describe and apply basic principles of plant nutrition.*
   a. Illustrated lecture and discussion.
   b. Illustrated lecture and discussion.
   c. Illustrated lecture and discussion.
   d. Laboratory demonstration and practice.
   e. Laboratory demonstration and practice.
   f. Student activity sheet.

Suggested Assessment Strategies:

1. *Describe and apply principles of plant growth media.*
   a. *Unit test.*
   b. *Unit test.*
   c. *Unit test.*
   d. *Performance activity.*
   e. *Performance activity.*
2. *Describe and apply basic principles of plant nutrition.*
   a. *Unit test.*
   b. *Unit test.*
   c. *Unit test.*
   d. *Performance activity.*
   e. *Performance activity.*
   f. *Performance activity.*

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Soil Test Procedures Pamphlet from Mississippi Cooperative Extension Service.

HORTICULTURE I
UNIT 6: INTRODUCTION TO HORTICULTURE STRUCTURES (5 days)

Competencies and Suggested Objectives:

1. Describe the characteristics and features of different types of greenhouses.
   a. Identify and compare the different styles of greenhouses (Quonset, Gothic, lean-to, A-frame, etc.).
   b. Identify and compare the different types of greenhouse frames (metal, wood, plastic/PVC, etc.) and coverings (fiberglass, glass, polyethylene, lexon, etc.).
   c. Identify and compare the different types of heating, cooling, and ventilation systems used in greenhouses.
   d. Identify and compare the types of irrigation and chemigation systems used in greenhouses.
   e. Identify and describe factors to consider in establishing a floor plan for a greenhouse including benching, flooring, and traffic patterns.
   f. Describe sanitation practices employed in greenhouse production.

   Related Academic Topics (See Appendix A): C2, C6, M5, S5, S6
   Workplace Skills (See Appendix B): WP2, WP6
2. Describe auxiliary structures associated with horticulture.
   a. Describe the functions of auxiliary structures associated with horticultural operations including lathe houses, cold frames, shade houses, hot beds, potting facilities, chemical and dry storage facilities, etc.

   Related Academic Topics (See Appendix A): C6, S6
   Workplace Skills (See Appendix B): WP2

Suggested Teaching Strategies:

1. *Describe the characteristics and features of different types of greenhouses.*
   a. Illustrated lecture, field trips, and/or resource speakers.
   b. Illustrated lecture, field trips, and/or resource speakers.
   c. Illustrated lecture, field trips, and/or resource speakers.
   d. Illustrated lecture, field trips, and/or resource speakers.
   e. Illustrated lecture, field trips, and/or resource speakers.
   f. Illustrated lecture, field trips, and/or resource speakers.
2. *Describe auxiliary structures associated with horticulture.*
   a. Illustrated lecture, field trips, and/or resource speakers.

Suggested Assessment Strategies:

1. *Describe the characteristics and features of different types of greenhouses.*
   a. Unit test.

b. Unit test.
c. Unit test.
d. Unit test.
e. Unit test.
f. Unit test.

2. *Describe auxiliary structures associated with horticulture operations.*
   a. Unit test.

Suggested References:

Richardson, William D., and Moore, Gary E. Working in Horticulture. New York Greg/McGraw Hill. Current edition.

Schroeder, Charles B. et al. Introduction to Horticulture Science and Technology. Danville, IL: Interstate Publishers and Printers. 1995.

HORTICULTURE I
UNIT 7: BASIC PLANT PROPAGATION (15 days)

Competencies and Suggested Objectives:

1. Distinguish between sexual and asexual propagation methods.
   a. Describe the distinguishing characteristics of sexual and asexual propagation methods and discuss how these are used by horticulturists in reproducing and breeding plants.

   Related Academic Topics (See Appendix A): C6, S2
   Workplace Skills (See Appendix B): WP2, WP6
2. Describe and apply principles of sexual reproduction.
   a. Describe the sexual reproductive process in plants.
   b. Identify the parts of a seed and describe their functions.
   c. Propagate plants from seed.
   d. Conduct a seed germination test.

   Related Academic Topics (See Appendix A): S2, M6
   Workplace Skills (See Appendix B): WP2, WP6
3. Describe and apply principles of asexual reproduction.
   a. Identify the common types of asexual reproduction and discuss their applications in horticulture.
   b. Identify common tools used in asexual reproduction and demonstrate their safe care and use.
   c. Propagate plants from root, stem, and leaf cuttings.
   d. Propagate plants by division/separation.
   e. Propagate plants by layering.

   Related Academic Topics (See Appendix A): S2, S7
   Workplace Skills (See Appendix B): WP2

Suggested Teaching Strategies:

1. Distinguish between sexual and asexual propagation methods.
   a. Assigned readings, illustrated lecture and discussion.
2. Describe and apply principles of sexual reproduction.
   a. Illustrated lecture and discussion.
   b. Illustrated lecture and discussion.
   c. Laboratory demonstration and practice.
   d. Laboratory demonstration and practice.
3. Describe and apply principles of sexual reproduction.
   a. Illustrated lecture and discussion.
   b. Illustrated lecture and laboratory demonstration.
   c. Laboratory demonstration and practice.
   d. Laboratory demonstration and practice.

e. Laboratory demonstration and practice.

Suggested Assessment Strategies:

1. *Distinguish between sexual and asexual propagation methods.*
   a. *Unit test.*
2. *Describe and apply principles of sexual reproduction.*
   a. *Unit test.*
   b. *Unit test.*
   c. *Performance exercise.*
   d. *Performance exercise.*
3. *Describe and apply principles of asexual reproduction.*
   a. *Unit test.*
   b. *Performance exercise.*
   c. *Performance exercise.*
   d. *Performance exercise.*
   e. *Performance exercise.*

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Ball Red Book.

HORTICULTURE I
UNIT 8: HORTICULTURE CHEMICAL AND PEST MANAGEMENT (20 days)

Competencies and Suggested Objectives:

1. Identify common pests and describe the ways in which they cause damage to horticultural crops.
   a. Identify common insect pests of horticultural crops and describe how each causes damage to the crop.
   b. Identify common diseases of horticultural crops and describe how each causes damage to the crop.
   c. Identify common weeds found in horticultural crops and describe how weeds cause damage to crops.
   d. Describe requirements for plant pest control certification/licensure.

   Related Academic Topics (See Appendix A): C2, S2
   Workplace Skills (See Appendix B): WP2, WP6
2. Identify and apply pest management and control methods.
   a. Identify and describe the use of biological control methods including use of beneficial insects, resistant varieties, repellant plants, etc.
   b. Identify and describe the use of cultural control methods including sanitation, mechanical practices, crop rotation, etc.
   c. Identify and describe the use of chemical control methods including herbicides, insecticides, fungicides, etc.
   d. Identify the different types of chemical formulations including dusts, wetable powders, emulsions, granules, concentrated liquids, aerosols and fumigants, stickers and spreaders, etc.
   e. Identify common names and trade names for chemicals frequently used in horticulture including insecticides, herbicides, and fungicides.
   f. Interpret information found on a chemical label.
   g. Demonstrate safe, approved procedures for handling, storing, mixing, applying, and disposing of chemicals and chemical containers.

   Related Academic Topics (See Appendix A): C1, C2, C4, M4, S2
   Workplace Skills (See Appendix B): WP2, WP6

Suggested Teaching Strategies:

1. *Identify common pests and describe the ways in which they cause damage to horticultural crops.*
   a. Illustrated lecture and discussion, specimens, and collections.
   b. Illustrated lecture and discussion, specimens, and collections.
   c. Illustrated lecture and discussion, specimens, and collections.
   d. Discussion.

2. *Identify and apply pest management and control methods.*
   a. *Illustrated lecture and discussion, laboratory demonstration.*
   b. *Illustrated lecture and discussion, laboratory demonstration.*
   c. *Illustrated lecture and discussion, laboratory demonstration.*
   d. *Illustrated lecture and discussion, laboratory demonstration.*
   e. *Illustrated lecture and discussion.*
   f. *Illustrated lecture and discussion, student assignment.*
   g. *Laboratory demonstration and practice.*

Suggested Assessment Strategies:

1. *Identify common pests and describe the ways in which they cause damage to horticultural crops.*
   a. *Unit test, assessment of student collection.*
   b. *Unit test, assessment of student collection.*
   c. *Unit test, assessment of student collection.*
   d. *Unit test.*
2. *Identify and apply pest management and control methods.*
   a. *Unit test.*
   b. *Unit test.*
   c. *Unit test.*
   d. *Unit test.*
   e. *Unit test.*
   f. *Unit test and assessment of student assignment.*
   g. *Performance activity.*

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Richardson, William D., and Moore, Gary E. Working in Horticulture. New York: Greg/McGraw Hill. Current edition.

HORTICULTURE I
UNIT 9: BASIC PRINCIPLES OF FLORISTRY (15 days)

Competencies and Suggested Objectives:

1. Describe and apply basic principles of floristry.
   a. Describe career opportunities in floristry ranging from owner-operator to designer and salesperson.
   b. Demonstrate the safe and proper use of tools and supplies used in floristry including shears, tape, foam, floral wire, etc.
   c. Identify plant materials used in floristry including flower and foliage materials.
   d. Demonstrate the procedures for receiving and storing (including rotation of inventory) of floral materials.
   e. Describe basic design principles including balance, transition, rhythm, focal point, proportion, scale, etc.
   f. Receive and process orders for floral products.
   g. Create basic floral design products including a packaged single corsage, bud vase, round centerpiece, and a dressed (wrapped) potted plant.

   Related Academic Topics (See Appendix A): C6, M7, S2
   Workplace Skills (See Appendix B): WP2

Suggested Teaching Strategies:

1. *Describe and apply basic principles of floristry.*
   a. Illustrated lecture and student reports.
   b. Laboratory demonstration and practice.
   c. Illustrated lecture and demonstration, field trip to local florist.
   d. Laboratory demonstration and practice.
   e. Illustrated lecture and discussion.
   f. Laboratory demonstration and practice.
   g. Laboratory demonstration and practice.

Suggested Assessment Strategies:

1. *Describe and apply basic principles of floristry.*
   a. Unit test.
   b. Performance activity.
   c. Unit test.
   d. Performance activity.
   e. Unit test.
   f. Performance activity.
   g. Performance activity.

Suggested References:

Behe, Bridget K. et al. The Retail Florist Business (5th ed.). Danville: Interstate Printers and Publishers. 1994.

Schroeder, Charles B. et al. Introduction to Horticulture Science and Technology. Danville, IL: Interstate Publishers and Printers. 1995.

HORTICULTURE I
UNIT 10: GREENHOUSE CROPS **(10 days)**

Competencies and Suggested Objectives:

1. Describe and apply principles of greenhouse crop production.
   a. Identify different types of greenhouse crops (bedding plants, vegetables, flowering plants, foliage plants, etc.) and common species of each type.
   b. Describe cultural considerations for greenhouse crops including fertilizer, water, growing medium, pest control, temperature, natural and chemical growth control and stimulation, and light control for common crops.
   c. Produce a greenhouse crop following accepted commercial practices.

   Related Academic Topics (See Appendix A): C6, S3, M7, S2
   Workplace Skills (See Appendix B): WP2, WP4, WP5

Suggested Teaching Strategies:

1. *Describe and apply principles of greenhouse crop production.*
   a. Illustrated lecture and discussion, field trip to commercial greenhouses or resource speaker.
   b. Illustrated lecture and discussion, field trip to commercial greenhouses or resource speaker.
   c. Laboratory demonstration and practice.

Suggested Assessment Strategies:

1. *Describe and apply principles of greenhouse crop production.*
   a. Unit test.
   b. Unit test.
   c. Performance activity.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Ball Red Book

Greenhouse Crop Production

HORTICULTURE I
UNIT 11: OLERICULTURE PRODUCTION **(10 days)**

Competencies and Suggested Objectives:

1. Describe and apply principles of olericulture production.
   a. Describe characteristics of common vegetables grown for commercial production including cultural requirements, seed versus transplant planting, plant growth style, growing season, etc.
   b. Identify and demonstrate the use of common tools and equipment used in gardening including tillers, spreaders, sprayers, watering devices, rakes, hoes, shovels, etc.
   c. Identify and describe factors to consider in preparing a seedbed including soil class and texture, use of soil amendments, and characteristics of a properly prepared seedbed.
   d. Develop a plan for an intensive culture garden including crop and variety selection, location and spacing of different crops, scheduling of crops, and harvesting and marketing of crops.
   e. Describe cultural practices associated with growing of vegetables including fertilization, integrated pest control measures, and irrigation.
   f. Identify common garden pests including insects, diseases, and weeds.
   g. Produce a vegetable crop.

   Related Academic Topics (See Appendix A): C6, S2, S3, S4
   Workplace Skills (See Appendix B): WP2, WP4, WP6

Suggested Teaching Strategies:

1. *Describe and apply principles of olericulture production.*
   a. Illustrated lecture and discussion.
   b. Laboratory demonstration and practice.
   c. Illustrated lecture and discussion.
   d. Student assignment.
   e. Illustrated lecture and discussion.
   f. Illustrated lecture and discussion, specimens and collections.
   g. Laboratory demonstration and practice.

Suggested Assessment Strategies:

1. *Describe and apply principles of olericulture production.*
   a. Unit test.
   b. Performance exercise.
   c. Unit test.
   d. Assessment of student assignment.

e. Unit test.
f. Unit test.
g. Performance exercise.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Garden Tabloid. Mississippi Cooperative Extension Service.

HORTICULTURE I
UNIT 12: INTERIOR PLANTSCAPING **(10 days)**

Competencies and Suggested Objectives:

1. Describe and apply principles of interior plantscaping.
   a. Describe careers in interior plantscaping.
   b. Define interior plantscaping and discuss its importance.
   c. Describe factors to consider in selecting plants for interior plantscaping.
   d. Identify plants for specific locations in plantscaping.
   e. Describe cultural procedures for interior plantscapes including fertilization, watering, sanitation, and pest control.
   f. Plan, construct, and maintain an interior plantscape.

   Related Academic Topics (See Appendix A): C6, S2, S6
   Workplace Skills (See Appendix B): WP2, WP6

Suggested Teaching Strategies:

1. *Describe and apply principles of interior plantscaping.*
   a. Illustrated lecture and discussion and/or resource person.
   b. Illustrated lecture and discussion.
   c. Illustrated lecture and discussion.
   d. Illustrated lecture and discussion.
   e. Illustrated lecture and discussion and/or field trip.
   f. Student assignment, laboratory demonstration and practice.

Suggested Assessment Strategies:

1. *Describe and apply principles of interior plantscaping.*
   a. Unit test.
   b. Unit test.
   c. Unit test.
   d. Unit test.
   e. Unit test.
   f. Performance activity.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Schroeder, Charles B. et al. Introduction to Horticulture Science and Technology. Danville, IL: Interstate Publishers and Printers. 1995.

HORTICULTURE II

HORTICULTURE II
UNIT 1: HORTICULTURE CAREERS (5 days)

Competencies and Suggested Objectives:

1. Investigate career and educational opportunities in horticulture.
   a. Prepare a comprehensive report on a career in a chosen occupational area based on research and observations.
   b. Develop a plan for post-high school activities (education, employment, entrepreneurship, etc.).
   c. Utilize electronic communication (Internet or E-mail, if available) to obtain occupational information.

   Related Academic Topics (See Appendix A): C6
   Workplace Skills (See Appendix B): WP2, WP3, WP6
2. Review program policies and procedures.
   a. Review program operation policies and procedures, including general safety procedures.

   Related Academic Topics (See Appendix A): C6
   Workplace Skills (See Appendix B): WP2, WP6

Suggested Teaching Strategies:

1. *Investigate career and educational opportunities in horticulture.*
   a. *Student assignment to prepare a comprehensive report including research and work-based observations.*
   b. *Student assignment to plan post-high school activities (Career/Educational Plan).*
   c. *Student assignment to utilize electronic communication (Internet or E-mail, if available) to obtain occupational information.*
2. *Review program policies and procedures.*
   a. *Lecture and discussion.*

Suggested Assessment Strategies:

1. *Investigate career and educational opportunities in horticulture.*
   a. *Assessment of student report.*
   b. *Assessment of student plan.*
   c. *Assessment of student communication.*
2. *Review program policies and procedures.*
   a. *Unit test.*

Suggested References:

School's Career Center and/or Library.

Resource speakers (Employment Service, Community College Instructors, Industry Representatives).

Local student handbook.

HORTICULTURE II
UNIT 2: NURSERY AND LANDSCAPE PLANT IDENTIFICATION (15 days)

Competencies and Suggested Objectives:

1. Identify and describe the use of major plants used associated with nursery and landscape operations.
   a. Identify and describe the use of major nursery plants including trees, shrubs, ground covers, vines, and ornamental grasses.
   b. Identify and describe the use of major flowering plants including annuals, biennials, and perennials.
   c. Identify and describe the use of major water plants.
   d. Identify and describe the use of major foliage plants used in nursery and landscape operations.
   e. Identify and describe the use of wildflowers in landscape operations.

   Related Academic Topics (See Appendix A): S2
   Workplace Skills (See Appendix B): WP2

Suggested Teaching Strategies:

1. *Identify and describe the use of major plants associated with nursery and landscape operations.*
   a. Illustrated lecture and discussion, specimen collections, field trips, and/or resource speakers.
   b. Illustrated lecture and discussion, specimen collections, field trips, and/or resource speakers.
   c. Illustrated lecture and discussion, specimen collections, field trips, and/or resource speakers.
   d. Illustrated lecture and discussion, specimen collections, field trips, and/or resource speakers.
   e. Illustrated lecture and discussion, specimen collections, field trips, and/or resource speakers.

Suggested Assessment Strategies:

1. *Identify and describe the use of major plants associated with nursery and landscape operations.*
   a. Unit test and laboratory performance assessment.
   b. Unit test and laboratory performance assessment.
   c. Unit test and laboratory performance assessment.
   d. Unit test and laboratory performance assessment.
   e. Unit test and laboratory performance assessment.

Suggested References:

FFA Contest Handbook Plant Identification List.

Gridwell, Ferrell. Landscape Plants. Albany, NY: Delmar Publishers. 1994.

HORTICULTURE II
UNIT 3: ADVANCED PLANT PROPAGATION **(10 days)**

Competencies and Suggested Objectives:

1. Describe and apply advanced plant propagation methods.
   a. Propagate plants by grafting.
   b. Propagate plants from scarified or stratified seeds.
   c. Propagate plants by tissue culture.
   Related Academic Topics (See Appendix A): S2, S7
   Workplace Skills (See Appendix B): WP2

Suggested Teaching Strategies:

1. Describe and apply advanced plant propagation methods.
   a. Laboratory demonstration and practice.
   b. Laboratory demonstration and practice.
   c. Laboratory demonstration and practice.

Suggested Assessment Strategies:

1. Describe and apply advanced plant propagation methods.
   a. Performance assessment.
   b. Performance assessment.
   c. Performance assessment.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Richardson, William D., and Moore, Gary E. Working in Horticulture. New York: Greg/McGraw Hill. Current edition.

HORTICULTURE II
UNIT 4: HORTICULTURE MARKETING AND BUSINESS PROCEDUR: (10 days)

Competencies and Suggested Objectives:

1. Describe and apply marketing and business practices associated with horticulture operations.
   a. Develop a yearly schedule of activities/enterprises for a horticulture business.
   b. Describe factors to consider in ordering materials/supplies for an enterprise.
   c. Describe factors to consider in pricing products of an enterprise.
   d. Describe factors to consider in marketing and advertising products.
   e. Complete a sales transaction including providing customer service and completing a sales ticket.

   Related Academic Topics (See Appendix A): C4, C6, M1, M7
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP4, WP6

Suggested Teaching Strategies:

1. *Describe and apply marketing and business practices associated with horticulture operations.*
   a. Student assignment.
   b. Illustrated lecture and discussion, resource speaker.
   c. Illustrated lecture and discussion.
   d. Illustrated lecture and discussion.
   e. Laboratory demonstration and practice through role play.

Suggested Assessment Strategies:

1. *Describe and apply marketing and business practices associated with horticulture operations.*
   a. Assessment of student assignment.
   b. Unit test.
   c. Unit test.
   d. Unit test.
   e. Performance exercise.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Nursery Production. Penn State University.

Behe, Bridgette et al. The Retail Florist Business. Danville: Interstate Publishers and Printers. 1994.

HORTICULTURE II
UNIT 5: CONTAINER AND FIELD CROP PRODUCTION (10 days)

Competencies and Suggested Objectives:

1. Describe and apply principles of container and field crop production.
   a. Describe advantages and disadvantages of container crop production.
   b. Describe factors to consider in selecting a site for container and field crop production.
   c. Describe factors to consider in selecting a container for production.
   d. Identify and demonstrate the safe use of tools and equipment for container and field crop production.
   e. Describe cultural requirements for container and field crop production including fertilizer, water, pest control, and harvesting procedures.
   f. Produce container and field grown plants.
   g. Describe automation and plug production in the nursery industry.

   Related Academic Topics (See Appendix A): C6, M7, S2, S4
   Workplace Skills (See Appendix B): WP2, WP6

Suggested Teaching Strategies:

1. Describe and apply principles of container and field crop production.
   a. Illustrated lecture and discussion.
   b. Illustrated lecture and discussion, field trip.
   c. Illustrated lecture and discussion.
   d. Laboratory demonstration and practice.
   e. Illustrated lecture and discussion, field trip.
   f. Laboratory demonstration and practice.
   g. Illustrated lecture and discussion, field trip.

Suggested Assessment Strategies:

1. Describe and apply principles of container and field crop production.
   a. Unit test.
   b. Unit test.
   c. Unit test.
   d. Performance activity.
   e. Unit test.
   f. Performance activity.
   g. Unit test.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Ingles, Jack E. Ornamental Horticulture: Science, Operations, and Management (2nd ed.). Albany: Delmar. 1994.

Schroeder, Charles B. et al. Introduction to Horticulture: Science and Technology. Danville: Interstate Printers and Publishers. 1995.

HORTICULTURE II
UNIT 6: FLORICULTURE CROP PRODUCTION **(10 days)**

Competencies and Suggested Objectives:

1. Describe and apply principles of floral crop production.
   a. Develop growing plans and schedules for a fall and a spring floral crop.
   b. Describe optimum production practices for flower crops to include benches and media, shading/light requirements, temperature, water, fertilizer, and pest control practices.
   c. Produce a specialty flower crop.

   Related Academic Topics (See Appendix A): C6, S2
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. Describe and apply principles of floral crop production.
   a. Student assignment.
   b. Illustrated lecture and discussion.
   c. Laboratory demonstration and practice.

Suggested Assessment Strategies:

1. Describe and apply principles of floral crop production.
   a. Assessment of student assignment.
   b. Unit test.
   c. Performance activity.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Greenhouse Crop Production.

Ball Red Book.

HORTICULTURE II
UNIT 7: LANDSCAPE DESIGN **(20 days)**

Competencies and Suggested Objectives:

1. Describe and apply principles of landscape design
   a. Describe careers in the landscape design field.
   b. Identify and demonstrate the use of tools and equipment for landscape design, including computer-assisted landscape design hardware and software.
   c. Identify symbols used in landscape design plans.
   d. Describe principles of design associated with landscaping including simplicity, balance, proportion, etc.
   e. Prepare a site analysis/needs assessment for a given site.
   f. Prepare a simple landscape plan to scale for a given site to include plant selection and location.

   Related Academic Topics (See Appendix A): C6,
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. Describe and apply principles of landscape design.
   a. Illustrated lecture, resource speaker, or field trip.
   b. Laboratory demonstration and practice.
   c. Illustrated lecture.
   d. illustrated lecture and discussion.
   e. Student assignment.
   f. Student assignment.

Suggested Assessment Strategies:

1. Describe and apply principles of landscape design.
   a. Unit test.
   b. Performance exercise.
   c. Unit test.
   d. Unit test.
   e. Assessment of student assignment.
   f. Assessment of student assignment.

Suggested References:

Ingles, Jack. Landscaping Principles and Practices (4th ed.). Albany: Delmar. 1992.

HORTICULTURE II
UNIT 8: LANDSCAPE INSTALLATION AND CONSTRUCTION (15 days)

Competencies and Suggested Objectives:

1. Describe and apply basic principles of landscape installation and construction.
   a. Describe essential elements of a landscape installation contract and pricing proposal.
   b. Develop a contract and pricing proposal for the landscape plan developed by the students in Unit 7.
   c. Prepare a planting site, install plants, and provide post-transplant care according to a landscape plan.
   d. Describe licensing requirements for landscape installation.
   e. Demonstrate installation of a landscape irrigation system.

   Related Academic Topics (See Appendix A): C6, M7
   Workplace Skills (See Appendix B): WP1, WP3, WP6

Suggested Teaching Strategies:

1. Describe and apply basic principles of landscape installation and construction.
   a. Illustrated lecture and discussion.
   b. Student assignment.
   c. Laboratory demonstration and practice.
   d. Illustrated lecture and discussion.
   e. Illustrated lecture and discussion.

Suggested Assessment Strategies:

1. Describe and apply basic principles of landscape installation and construction.
   a. Unit test.
   b. Assessment of student assignment.
   c. Performance exercise.
   d. Unit test.
   e. Performance exercise.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Ingles, Jack. Landscaping Principles and Practices (4th ed.). Albany: Delmar. 1992.

Gridwell, Ferrell. Landscape Plants. Albany, NY: Delmar Publishers. 1994.

HORTICULTURE II
UNIT 9: LANDSCAPE MAINTENANCE (10 days)

Competencies and Suggested Objectives:

1. Describe and apply principles of landscape maintenance.
   a. Discuss skills required for year-round landscape maintenance.
   b. Identify and demonstrate the safe use of equipment for landscape maintenance including saws, pruning shears, string trimmers, hedge trimmers, blowers, etc.
   c. Determine fertilizer and pest control needs of trees, shrubs, and beds.
   d. Develop a year-round schedule and cost estimate for maintenance of trees, shrubs, and beds.
   e. Maintain trees, shrubs, and beds according to the year-round schedule.
   f. Demonstrate maintenance of a landscape irrigation system.
   g. Describe elements of a contract and warranty agreement for landscape maintenance.

   Related Academic Topics (See Appendix A): C6, S2
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Describe and apply principles of landscape maintenance.*
   a. Illustrated lecture and discussion.
   b. Laboratory demonstration and practice.
   c. Student assignment.
   d. Student assignment.
   e. Laboratory demonstration and practice.
   f. Laboratory demonstration and practice.
   g. Illustrated lecture and discussion.

Suggested Assessment Strategies:

1. *Describe and apply principles of landscape maintenance.*
   a. Unit test.
   b. Performance exercise.
   c. Assessment of student assignment.
   d. Assessment of student assignment.
   e. Performance exercise.
   f. Performance exercise.
   g. Unit test.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Ingles, Jack. Landscaping Principles and Practices (4th ed.). Albany: Delmar. 1992.

HORTICULTURE II
UNIT 10: TURFGRASS INSTALLATION AND MAINTENANCE (10 days)

Competencies and Suggested Objectives:

1. Describe and apply principles of turfgrass installation.
   a. Describe factors to consider in selecting a turfgrass for a specific area.
   b. Identify varieties of turfgrass and describe their characteristics.
   c. Describe installation practices for different turfgrasses, including site preparation and initial care.
   d. Develop a plan and cost estimate for establishing turf.

   Related Academic Topics (See Appendix A): C6, S2, M7
   Workplace Skills (See Appendix B): WP1, WP2, WP6
2. Describe and apply principles of turfgrass maintenance.
   a. Identify and demonstrate the safe use of equipment and tools used for turfgrass maintenance including mowers, dethatchers, aerators, etc.
   b. Perform preventive maintenance on small gasoline engine power equipment such as changing oil and filters, mixing gasoline and oil for two-cycle engines, servicing the engine, etc.
   c. Identify common pests of turfgrass including insects, diseases, and weeds.
   d. Mow turf to correct height for a specific grass.
   e. Calibrate equipment and apply fertilizer to turf in correct proportions.
   f. Calibrate equipment and apply herbicides, pesticides, and other pest control chemicals in correct proportions.
   g. Describe common irrigation methods for turfgrass.
   h. Perform repair/renovation practices including aeration and dethatching.
   i. Develop a plan/cost estimate for a turfgrass management program.

   Related Academic Topics (See Appendix A): C6, M7, S2, S6
   Workplace Skills (See Appendix B): WP1, WP2, WP6

Suggested Teaching Strategies:

1. *Describe and apply principles of turfgrass installation.*
   a. Illustrated lecture and discussion.
   b. Field trip with illustrated lecture and discussion.
   c. Illustrated lecture and discussion.
   d. Student assignment.
2. *Describe and apply principles of turfgrass maintenance.*
   a. Laboratory demonstration and practice.
   b. Laboratory demonstration and practice.
   c. Laboratory demonstration and practice.
   d. Laboratory demonstration and practice.

e. *Laboratory demonstration and practice.*
f. *Laboratory demonstration and practice.*
g. *Illustrated lecture or field trips.*
h. *Laboratory demonstration and practice.*
i. *Laboratory demonstration and practice.*

Suggested Assessment Strategies:

1. *Describe and apply principles of turfgrass installation.*
   a. *Unit test.*
   b. *Unit test.*
   c. *Unit test.*
   d. *Assessment of student assignment.*
2. *Describe and apply principles of turfgrass maintenance.*
   a. *Performance exercise.*
   b. *Performance exercise.*
   c. *Performance exercise.*
   d. *Performance exercise.*
   e. *Performance exercise.*
   f. *Performance exercise.*
   g. *Unit test.*
   h. *Performance exercise.*
   i. *Performance exercise.*

Suggested References:

Schroeder, Charles B., and Sprague, Howard B. Turf Management Handbook (4th ed.). Danville: Interstate Publishers and Printers. 1994.

Ingles, Jack. Ornamental Horticulture: Science, Operations, and Management (2nd ed.). Danville: Interstate Printers and Publishers. 1994.

Schroeder, Charles B. et al. Introduction to Horticulture Science and Technology. Danville, IL: Interstate Publishers and Printers. 1995.

HORTICULTURE II
UNIT 11: POMOLOGY PRODUCTION **(5 days)**

Competencies and Suggested Objectives:

1. Describe and apply principles of fruit and berry production.
   a. Identify common fruits and berries produced in Mississippi and discuss general cultural practices.
   b. Prepare a site and install fruit or berry plants.
   c. Provide cultural care for fruit or berry plants to include pruning, fertilizing, pest control, and harvesting.
   d. Describe marketing of fruits and vegetables.

   Related Academic Topics (See Appendix A): S2
   Workplace Skills (See Appendix B): WP2, WP6

Suggested Teaching Strategies:

1. Describe and apply principles of fruit and berry production.
   a. Illustrated lecture and discussion with field trips.
   b. Laboratory demonstration and practice.
   c. Laboratory demonstration and practice.
   d. Illustrated lecture and discussion with field trips.

Suggested Assessment Strategies:

1. Describe and apply principles of fruit and berry production.
   a. Unit test.
   b. Performance activity.
   c. Performance activity.
   d. Unit test.

Suggested References:

Reily, Edward H., and Shry, Carroll L. Introductory Horticulture (5th ed.). Albany: Delmar Publishers. 1995.

Ingles, Jack. Ornamental Horticulture: Science, Operations, and Management (2nd ed.). Danville: Interstate Printers and Publishers. 1994.

Schroeder, Charles B. et al. Introduction to Horticulture Science and Technology. Danville, IL: Interstate Publishers and Printers. 1995.

HORTICULTURE II
UNIT 12: ADVANCED FLORAL DESIGN **(15 days)**

Competencies and Suggested Objectives:

1. Apply advanced principles of floral design.
   a. Prepare a wire order for a floral arrangement.
   b. Receive a wire order for a floral arrangement.
   c. Prepare a window display.
   d. Prepare a funeral spray.
   e. Prepare a nosegay arrangement.
   f. Prepare a dried arrangement.
   g. Prepare a silk arrangement.
   Related Academic Topics (See Appendix A): C3, C6, M7
   Workplace Skills (See Appendix B): WP1, WP2, WP3, WP6

Suggested Teaching Strategies:

1. Apply advanced principles of floral design.
   a. Laboratory demonstration and practice.
   b. Laboratory demonstration and practice.
   c. Laboratory demonstration and practice.
   d. Laboratory demonstration and practice.
   e. Laboratory demonstration and practice.
   f. Laboratory demonstration and practice.
   g. Laboratory demonstration and practice.

Suggested Assessment Strategies:

1. Apply advanced principles of floral design.
   a. Peformance exercise.
   b. Peformance exercise.
   c. Peformance exercise.
   d. Peformance exercise.
   e. Peformance exercise.
   f. Peformance exercise.
   g. Peformance exercise.

Suggested References:

Behe, Bridgette et al. The Retail Florist Business. Danville: Interstate Publishers and Printers. 1994.

SECTION III:

RECOMMENDED TOOLS AND EQUIPMENT

RECOMMENDED TOOLS AND EQUIPMENT FOR SECONDARY HORTICULTURE

1. Microscope (1 per 4 students)
2. Plant press (1 per student)
3. First aid kit
4. Fire extinguisher
5. Soil mixer
6. pH meter
7. Soil sterilizer
8. Soil test kit
9. Soil salinity meter
10. Soil probe
11. Greenhouse (minimum size 30' x 100') with lighting, heating, and ventilation systems (2 per program recommended)
12. Potting bench
13. Misting system with timer
14. Day/night timer
15. Greenhouse benches
16. Heating pads or cables for hotbed
17. Lathe house (minimum size 50' by 40')
18. Fertilizer proportioner
19. Shade cloth for greenhouse
20. Emergency backup heater
21. Water hoses with racks or reels
22. Watering nozzles and breakers
23. "Hose-on" sprayer
24. Buckets
25. Wheelbarrow
26. Greenhouse cart
27. Flat carrier
28. Trash cans
29. Sink with running water
30. Hedge shears
31. Loping shears
32. Hand pruners
33. Pole pruners
34. Hand trowel
35. Grafting knife
36. Germination chamber/seed incubator
37. Plant mobile with florescent light
38. Pruning saws
39. Chemical storage cabinet
40. Hand pump pressure sprayer (3 per program)

41. Respirator
42. Power-operated pressure sprayer
43. Face mask
44. Safety gloves
45. Protective suit
46. Safety goggles/glasses with monitor case
47. Floral shears
48. Ribbon shears
49. Glue guns
50. Picking machine
51. Wire cutters
52. Glue pans
53. Small hand tool set - pliers, screwdrivers, small wrenches, sockets, etc.
54. Floral cooler
55. Hoes
56. Garden rakes
57. Leaf rakes
58. Pitchforks
59. Pick
60. Potato forks
61. Scuffle hoe
62. Round point shovels
63. Square point shovels
64. Axe
65. Kaiser blade
66. Sledge hammer
67. Claw hammer
68. Posthole digger
69. Front tine tiller
70. Rear tine tiller
71. Fertilizer spreader
72. Files
73. Bench grinder
74. ⅜" power drill
75. 7½ inch hand held circular saw
76. Measuring tape
77. Extension cords
78. Tractor with field equipment (disk, harrow, cultivator, spreader, sprayer, etc.)
79. Light meter
80. Hand misters
81. Measuring cups and spoons
82. Water pool with recirculatiing pump
83. Tissue culture kit
84. Cash register

85. Calculator
86. Sales slip dispenser
87. Filing cabinet
88. Soil temperature meter
89. High/low registering thermometer
90. Mulitmedia personal computer with printer/plotter
91. Drafting tables
92. Drafting tools and instruments
93. Mulching machine/shredder
94. Rotary mower
95. String trimmer
96. Lawn edger
97. Hedge trimmer
98. Lawn blower
99. Soil plugger
100. Bulb planter
101. Aerator
102. Dethatcher
103. Roller
104. Small engine for training
105. Sprayer calibration kit

INSTRUCTIONAL MATERIALS AND AIDS

1. 35 mm slide projector
2. 35 mm SIR camera with macro lens
3. Projection screen
4. Video out (Microcomputer to TV monitor) (1)
5. Overhead projector
6. Video camcorder
7. VCR
8. TV/monitor
9. Career software package
10. Compound video camera with microscope adapter
11. Plant growth models
12. Landscape design software package
13. Plant identification kit (slides or CD-ROM software)
14. Plant disease identification kit (slides or CD-ROM software)
15. Insect identification kit (slides or CD-ROM software)
16. Cart, AV
17. Microcomputer with CD-ROM, SVGA graphics, and modem (1 per 4 students)

APPENDIX A:

RELATED ACADEMIC TOPICS

APPENDIX A

RELATED ACADEMIC TOPICS FOR COMMUNICATIONS

C1 Interpret written material.
C2 Interpret visual materials (maps, charts, graphs, tables, etc.).
C3 Listen, comprehend, and take appropriate actions.
C4 Access, organize, and evaluate information.
C5 Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.
C6 Communicate ideas and information effectively using various oral and written forms for a variety of audiences and purposes.

EXPANDED TOPICS FOR COMMUNICATIONS

TOPIC C1: Interpret written material.

C1.01 Read and follow complex written directions.
C1.02 Recognize common words and meanings associated with a variety of occupations.
C1.03 Adjust reading strategy to purpose and type of reading.
C1.04 Use sections of books and reference sources to obtain information.
C1.05 Compare information from multiple sources and check validity.
C1.06 Interpret items and abbreviations used in multiple forms.
C1.07 Interpret short notes, memos, and letters.
C1.08 Comprehend technical words and concepts.
C1.09 Use various reading techniques depending on purpose for reading.
C1.10 Find, read, understand, and use information from printed matter or electronic sources.

TOPIC C2: Interpret visual materials (maps, charts, graphs, tables, etc.).

C2.01 Use visuals in written and in oral presentations.
C2.02 Recognize visual cues to meaning (layout, typography, etc.).
C2.03 Interpret and apply information using visual materials.

TOPIC C3: Listen, comprehend, and take appropriate action.

C3.01 Identify and evaluate orally-presented messages according to purpose.
C3.02 Recognize barriers to effective listening.
C3.03 Recognize how voice inflection changes meaning.
C3.04 Identify speaker signals requiring a response and respond accordingly.
C3.05 Listen attentively and take accurate notes.
C3.06 Use telephone to receive information.

C3.07 Analyze and distinguish information from formal and informal oral presentations.

TOPIC C4: Access, organize, and evaluate information.

C4.01 Distinguish fact from opinion.
C4.02 Use various print and non-print sources for specialized information.
C4.03 Interpret and distinguish between literal and figurative meaning.
C4.04 Interpret written or oral communication in relation to context and writer's point of view.
C4.05 Use relevant sources to gather information for written or oral communication.

TOPIC C5: Use written and/or oral language skills to work cooperatively to solve problems, make decisions, take actions, and reach agreement.

C5.01 Select appropriate words for communication needs.
C5.02 Use reading, writing, listening, and speaking skills to solve problems.
C5.03 Compose inquiries and requests.
C5.04 Write persuasive letters and memos.
C5.05 Edit written reports, letters, memos, and short notes for clarity, correct grammar, and effective sentences.
C5.06 Write logical and understandable statements, phrases, or sentences for filling out forms, for correspondence or reports.
C5.07 Write directions or summaries of processes, mechanisms, events, or concepts.
C5.08 Select and use appropriate formats for presenting reports.
C5.09 Convey information to audiences in writing.
C5.10 Compose technical reports and correspondence that meet accepted standards for written communications.

TOPIC C6: Communicate ideas and information using oral and written forms for a variety of audiences and purposes.

C6.01 Give complex oral instructions.
C6.02 Describe a business or industrial process/mechanism.
C6.03 Participate effectively in group discussions and decision making.
C6.04 Produce effective oral messages . ing different media.
C6.05 Explore ideas orally with partners.
C6.06 Participate in conversations by volunteering information when appropriate and asking relevant questions when appropriate.
C6.07 Restate or paraphrase a conversation to confirm one's own understanding.
C6.08 Gather and provide information utilizing different media.

C6.09 Prepare and deliver persuasive, descriptive, and demonstrative oral presentations.

RELATED ACADEMIC TOPICS FOR MATHEMATICS

M1 Relate number relationships, number systems, and number theory.
M2 Explore patterns and functions.
M3 Explore algebraic concepts and processes.
M4 Explore the concepts of measurement.
M5 Explore the geometry of one-, two-, and three-dimensions.
M6 Explore concepts of statistics and probability in real world situations.
M7 Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

EXPANDED TOPICS FOR MATHEMATICS

TOPIC M1: Relate number relationships, number systems, and number theory.

M1.01 Understand, represent, and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, and scientific notation) in real world and mathematical problem situations.
M1.02 Develop number sense for whole numbers, fractions, decimals, integers, and rational numbers.
M1.03 Understand and apply ratios, proportions, and percents in a wide variety of situations.
M1.04 Investigate relationships among fractions, decimals, and percents.
M1.05 Compute with whole numbers, fractions, decimals, integers, and rational numbers.
M1.06 Develop, analyze, and explain procedures for computation and techniques for estimations.
M1.07 Select and use an appropriate method for computing from among mental arithmetic, paper-and-pencil, calculator, and computer methods.
M1.08 Use computation, estimation, and proportions to solve problems.
M1.09 Use estimation to check the reasonableness of results.

TOPIC M2: Explore patterns and functions.

M2.01 Describe, extend, analyze, and create a wide variety of patterns.
M2.02 Describe and represent relationships with tables, graphs, and rules.
M2.03 Analyze functional relationships to explain how a change in one quantity results in a change in another.
M2.04 Use patterns and functions to represent and solve problems.
M2.05 Explore problems and describe results using graphical, numerical, physical, algebraic, and verbal mathematical models or representations.

M2.06 Use a mathematical idea to further their understanding of other mathematical ideas.
M2.07 Apply mathematical thinking and modeling to solve problems that arise in other disciplines, such as art, music, and business.

TOPIC M3: Explore algebraic concepts and processes.

M3.01 Represent situations and explore the interrelationships of number patterns with tables, graphs, verbal rules, and equations.
M3.02 Analyze tables and graphs to identify properties and relationships and to interpret expressions and equations.
M3.03 Apply algebraic methods to solve a variety of real world and mathematical problems.

TOPIC M4: Explore the concepts of measurement.

M4.01 Estimate, make, and use measurements to describe and compare phenomena.
M4.02 Select appropriate units and tools to measure to the degree of accuracy required in a particular situation.
M4.03 Extend understanding of the concepts of perimeter, area, volume, angle measure, capacity, and weight and mass.
M4.04 Understand and apply reasoning processes, with special attention to spatial reasoning and reasoning with proportions and graphs.

TOPIC M5: Explore the geometry of one-, two-, and three-dimensions.

M5.01 Identify, describe, compare, and classify geometric figures.
M5.02 Visualize and represent geometric figures with special attention to developing spatial sense.
M5.03 Explore transformations of geometric figures.
M5.04 Understand and apply geometric properties and relationships.
M5.05 Classify figures in terms of congruence and similarity and apply these relationships.

TOPIC M6: Explore the concepts of statistics and probability in real world situations.

M6.01 Systematically collect, organize, and describe data.
M6.02 Construct, read, and interpret tables, charts, and graphs.
M6.03 Develop an appreciation for statistical methods as powerful means for decision making.
M6.04 Make predictions that are based on exponential or theoretical probabilities.

M6.05 Develop an appreciation f . pervasive us f probability in the real world.

TOPIC M7: Apply mathematical methods, concepts, and properties to solve a variety of real-world problems.

M7.01 Use computers and/or calculators to process information for all mathematical situations.
M7.02 Use problem-solving approaches to investigate and understand mathematical content.
M7.03 Formulate problems from situations within and outside mathematics.
M7.04 Generalize solutions and strategies to new problem situations.

RELATED ACADEMIC TOPICS FOR SCIENCE

S1 Explain the Anatomy and Physiology of the human body.
S2 Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.
S3 Relate the nine major phyla of the kingdom animalia according to morphology, anatomy, and physiology.
S4 Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.
S5 Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.
S6 Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.
S7 Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance, population genetics, the structure and function of DNA, and current applications of DNA technology.
S8 Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

EXPANDED TOPICS FOR SCIENCE

TOPIC S1: Explain the Anatomy and Physiology of the human body.

S1.01 Recognize common terminology and meanings.
S1.02 Explore the relationship of the cell to more complex systems within the body.

S1.03 Summarize the functional anatomy of all the major body systems.
S1.04 Relate the physiology of the major body systems to its corresponding anatomy.
S1.05 Compare and contrast disease transmission and treatment within each organ system.
S1.06 Explore the usage of medical technology as related to human organs and organ systems.
S1.07 Explain the chemical composition of body tissue.

TOPIC S2: Apply the basic biological principles of Plants, Viruses and Monerans, Algae, Protista, and Fungi.

S2.01 Identify the major types and structures of plants, viruses, monera, algae protista, and fungi.
S2.02 Explain sexual and asexual reproduction.
S2.03 Describe the ecological importance of plants as related to the environment.
S2.04 Analyze the physical chemical and behavioral process of a plant.

TOPIC S3: Relate the nine major phyla of the kingdom animalia according to morphology, anatomy, and physiology.

S3.01 Explain the morphology, anatomy, and physiology of animals.
S3.02 Describe the characteristics, behaviors, and habitats of selected animals.

TOPIC S4: Explore the chemical and physical properties of the earth to include Geology, Meteorology, Oceanography, and the Hydrologic Cycle.

S4.01 Examine minerals and their identification, products of the rock cycle, byproducts of weathering, and the effects of erosion.
S4.02 Relate the Hydrologic Cycle to include groundwater its zones, movement, and composition; surface water systems, deposits, and runoff.
S4.03 Consider the effects of weather and climate on the environment.
S4.04 Examine the composition of seawater; wave, tides, and currents; organisms, environment, and production of food; energy, food and mineral resources of the oceans.

TOPIC S5: Investigate the properties and reactions of matter to include symbols, formulas and nomenclature, chemical equations, gas laws, chemical bonding, acid-base reactions, equilibrium, oxidation-reduction, nuclear chemistry, and organic chemistry.

S5.01 Examine the science of chemistry to include the nature of matter, symbols, formulas and nomenclature, and chemical equations.

S5.02 Identify chemical reactions including precipitation, acids-bases, and reduction-oxidation.
S5.03 Explore the fundamentals of chemical bonding and principles of equilibrium.
S5.04 Relate the behavior of gases.
S5.05 Investigate the structure, reactions, and uses of organic compounds; and investigate nuclear chemistry and radiochemistry.

TOPIC S6: Explore the principles and theories related to motion, mechanics, electricity, magnetism, light energy, thermal energy, wave energy, and nuclear physics.

S6.01 Examine fundamentals of motion of physical bodies and physical dynamics.
S6.02 Explore the concepts and relationships among work, power, and energy.
S6.03 Explore principles, characteristics, and properties of electricity, magnetism, light energy, thermal energy, and wave energy.
S6.04 Identify principles of modern physics related to nuclear physics.

TOPIC S7: Explore the principles of genetic and molecular Biology to include the relationship between traits and patterns of inheritance; population genetics, the structure and function of DNA, and current applications of DNA technology.

S7.01 Examine principles, techniques, and patterns of traits and inheritance in organisms.
S7.02 Apply the concept of population genetics to both microbial and multicellular organism.
S7.03 Identify the structure and function of DNA and the uses of DNA technology in science, industry, and society.

TOPIC S8: Apply concepts related to the scientific process and method to include safety procedures for classroom and laboratory; use and care of scientific equipment; interrelationships between science, technology and society; and effective communication of scientific results in oral, written, and graphic form.

S8.01 Apply the components of scientific processes and methods in classroom and laboratory investigations.
S8.02 Observe and practice safe procedures in the classroom and laboratory.
S8.03 Demonstrate proper use and care for scientific equipment.
S8.04 Investigate science careers, and advances in technology.
S8.05 Communicate results of scientific investigations in oral, written, and graphic form.

APPENDIX B:

WORKPLACE SKILLS

APPENDIX B
WORKPLACE SKILLS FOR THE 21ST CENTURY

WP1 Allocates resources (time, money, materials and facilities, and human resources).

WP2 Acquires, evaluates, organizes and maintains, and interprets/communicates information, including the use of computers.

WP3 Practices interpersonal skills related to careers including team member participation, teaching other people, serving clients/customers, exercising leadership, negotiation, and working with culturally diverse.

WP4 Applies systems concept including basic understanding, monitoring and correction system performance, and designing and improving systems.

WP5 Selects, applies, and maintains/troubleshoots technology.

WP6 Employs thinking skills including creative thinking, decision making, problem solving, reasoning, and knowing how to learn.

APPENDIX C:

STUDENT COMPETENCY PROFILE

STUDENT COMPETENCY PROFILE FOR HORTICULTURE I

Student: _____

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Horticulture Careers and Orientation

_____ 1. Identify careers in the horticulture industry.
_____ 2. Identify school and program policies and procedures related to the horticulture program.

Unit 2: Leadership Development

_____ 1. Identify and describe the role of organizations that encourage leadership development.

Unit 3: Plant Structure and Growth

_____ 1. Identify parts of a plant and their functions.
_____ 2. Describe the growth process in plants.

Unit 4: Plant Classification and Identification (Taxonomy)

_____ 1. Apply systems of plant classification.

Unit 5: Plant Growth Media and Nutrition

_____ 1. Describe and apply principles of plant growth media.
_____ 2. Describe and apply basic principles of plant nutrition.

Unit 6: Introduction to Horticulture Structures

_____ 1. Describe the characteristics and features of different types of greenhouses.
_____ 2. Describe auxiliary structures associated with horticulture.

Unit 7: Basic Plant Propagation

_____ 1. Distinguish between sexual and asexual propagation methods.
_____ 2. Describe and apply principles of sexual reproduction.
_____ 3. Describe and apply principles of asexual reproduction.

Unit 8: Horticulture Chemical and Pest Management

_____ 1. Identify common pests and describe the ways in which they cause damage to horticultural crops.
_____ 2. Identify and apply pest management and control methods.

Unit 9: Basic Principles of Floristry

_____ 1. Describe and apply basic principles of floristry.

Unit 10: Greenhouse Crops

_____ 1. Describe and apply principles of greenhouse crop production.

Unit 11: Olericulture Production

_____ 1. Describe and apply principles of olericulture production.

Unit 12: Interior Plantscaping

_____ 1. Describe and apply principles of interior plantscaping.

STUDENT COMPETENCY PROFILE FOR HORTICULTURE II

Student: _____

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Horticulture Careers

_____ 1. Investigate career and educational opportunities in horticulture.
_____ 2. Review program policies and procedures.

Unit 2: Nursery and Landscape Plant Identification

_____ 1. Identify and describe the use of major plants used associated with nursery and landscape operations.

Unit 3: Advanced Plant Propagation

_____ 1. Describe and apply advanced plant propagation methods.

Unit 4: Horticulture Marketing and Business Procedures

_____ 1. Describe and apply marketing and business practices associated with horticulture operations.

Unit 5: Container and Field Crop Production

_____ 1. Describe and apply principles of container and field crop production.

Unit 6: Floriculture Crop Production

_____ 1. Describe and apply principles of floral crop production.

Unit 7: Landscape Design

_____ 1. Describe and apply principles of landscape design.

Unit 8: Landscape Installation and Construction

_____ 1. Describe and apply basic principles of landscape installation and construction.

Unit 9: Landscape Maintenance

_____ 1. Describe and apply principles of landscape maintenance.

Unit 10: Turfgrass Installation and Maintenance

_____ 1. Describe and apply principles of turfgrass installation.
_____ 2. Describe and apply principles of turfgrass maintenance.

Unit 11: Pomology Production

_____ 1. Describe and apply principles of fruit and berry production.

Unit 12: Advanced Floral Design

_____ 1. Apply advanced principles of floral design.